

CLAIMS

What is claimed is:

- 1 1. A method for increasing reliability during a read and/or write operation in a disk
2 drive having a head, comprising:
3 reading data from a disk using a head;
4 measuring an amplitude of a signal obtained during reading the data;
5 determining a degree of variation in the signal amplitude as a function of a
6 position of the head relative to the disk; and
7 selectively heating the head based on the variation in the signal amplitude for
8 inducing protrusion of the head, thereby selectively reducing a fly height
9 of the head.

- 1 2. A method as recited in claim 1, wherein the selective heating corresponds to the
2 variation of the amplitude of the signal at various radial positions relative to the
3 disk.

- 1 3. A method as recited in claim 1, wherein the degree of signal amplitude variation
2 relates to variations in the fly height of the head over various portions of the disk.

- 1 4. A method as recited in claim 1, further comprising writing the data to the disk
2 prior to reading the data from the disk.

- 1 5. A method as recited in claim 1, wherein the head is selectively heated for
2 inducing protrusion of the head to a selected fly height at a particular radial
3 position of the head with respect to the disk.
- 1 6. A method as recited in claim 5, wherein the fly height is selected based on an
2 average fly height of the head over selected portions of the disk.
- 1 7. A method as recited in claim 1, wherein the signal amplitude variations are
2 determined using a modulation detector.
- 1 8. A method as recited in claim 1, wherein the signal amplitude variations are
2 determined by measuring a gain of the signal created by the head.
- 1 9. A method as recited in claim 1, wherein more heating is performed when the head
2 is positioned towards an inner diameter of the disk.
- 1 10. A method as recited in claim 1, further comprising varying an extent of the
2 heating based on the variation in the signal amplitude.
- 1 11. A method as recited in claim 1, wherein the heating is constant during operation
2 of the drive, wherein the protrusion is induced according to an extent of the
3 heating.

1 12. A method for increasing reliability during a read and/or write operation in a disk
2 drive having a head, comprising:
3 reading data from a disk using a head;
4 measuring an amplitude of a signal obtained during reading the data;
5 determining a degree of variation in the signal amplitude as a function of a
6 position of the head relative to the disk; and
7 selectively heating the head based on the variation in the signal amplitude for
8 inducing protrusion of the head to a selected fly height at a particular
9 radial position of the head with respect to the disk, the selective heating
10 further including varying an extent of the heating.

1 13. A method as recited in claim 12, wherein the selective heating corresponds to the
2 variation of the amplitude of the signal at various radial positions relative to the
3 disk.

1 14. A method as recited in claim 12, wherein the degree of signal amplitude variation
2 relates to variations in the fly height of the head over various portions of the disk.

1 15. A method as recited in claim 12, further comprising writing the data to the disk
2 prior to reading the data from the disk.

- 1 16. A method as recited in claim 15, wherein the fly height is selected based on an
2 average fly height of the head over selected portions of the disk.
- 1 17. A method as recited in claim 12, wherein the signal amplitude variations are
2 determined using a modulation detector.
- 1 18. A method as recited in claim 12, wherein the signal amplitude variations are
2 determined by measuring a gain of the signal created by the head.
- 1 19. A method as recited in claim 12, wherein more heating is performed when the
2 head is positioned towards an inner diameter of the disk.
- 1 20. A method as recited in claim 12, wherein the heating is constant during operation
2 of the drive, wherein the protrusion is induced according to an extent of the
3 heating.
- 1 21. A method for increasing reliability during a read and/or write operation in a disk
2 drive having a head, comprising:
3 mapping height variations of a surface of a disk; and
4 selectively heating the head at selected radial positions based on the disk surface
5 height variations for inducing protrusion of the head, thereby selectively
6 reducing a fly height of the head.

- 1 22. A method as recited in claim 21, wherein the disk height variations are mapped
2 using a modulation detector.
- 1 23. A method as recited in claim 21, wherein the disk height variations are mapped by
2 measuring a gain of a read signal created by the head.
- 1 24. A method as recited in claim 21, wherein the disk height variations are mapped
2 using a device that measures physical contours of the disk surface.
- 1 25. A method as recited in claim 21, wherein the selective heating corresponds to the
2 variation of the amplitude of the signal at various radial positions relative to the
3 disk.
- 1 26. A method as recited in claim 21, wherein the head is selectively heated for
2 inducing protrusion of the head to a selected fly height at a particular radial
3 position of the head with respect to the disk.
- 1 27. A method as recited in claim 26, wherein the fly height is selected based on an
2 average fly height of the head over selected portions of the disk.
- 1 28. A method as recited in claim 21, wherein more heating is performed when the
2 head is positioned towards an inner diameter of the disk.

- 1 29. A method as recited in claim 21, further comprising varying an extent of the
2 heating based on the height variations of the disk.
- 1 30. A method as recited in claim 21, wherein the heating is constant during operation
2 of the drive, wherein the protrusion is induced according to an extent of the
3 heating.
- 1 31. A magnetic storage system, comprising:
2 magnetic media;
3 at least one head having a heater;
4 a slider for supporting the at least one head; and
5 a control unit coupled to the head for controlling operation of the head;
6 wherein the magnetic storage system performs the method of claim 1.
- 1 32. A magnetic storage system, comprising:
2 magnetic media;
3 at least one head having a heater;
4 a slider for supporting the at least one head; and
5 a control unit coupled to the head for controlling operation of the head;
6 wherein the magnetic storage system performs the method of claim 21.